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Abstract

This invention is a reactor and system with a method for containing and controlling a deuterium nuclear fusion reaction in a palladium host metal lattice, now generally referred to as 'solid state fusion'. The reactor is designed for high temperature operation at moderate deuterium gas pressures and is operable over a temperature range of 400°C to more than 1400°C. The solid state fusion reaction is enabled and controlled by providing specific combinations of reactor temperatures and deuterium gas pressures. The invention is capable of generating heat densities that are suitable for commercial applications. The highest heat densities are produced at higher temperatures and moderate pressures where the system is most efficient and cost effective.